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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,831	01/15/2002	Madhu Chetuparambil	RSW920010180US1	5708

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EXAMINER
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MADAMBA, GLENFORD J

ART UNIT	PAPER NUMBER
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2151

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/047,831	CHETUPARAMBIL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Glenford Madamba	2151	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 July 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

AT

## **DETAILED ACTION**

### ***Response to Amendment***

1. This action is in response to amendments filed on July 12, 2005.
2. Claims 1-14 are pending in this application. Claims 11 – 14 have been added.

### ***Claim Objection***

1. Claim 13 is objected to as a self-referencing claim. To further prosecution of the application, the Office interprets Claim 13 to be dependent upon Claim 1, for examining purposes.

### ***Response to Arguments***

1. Applicant's arguments filed July 12, 2005 have been fully considered but they are not persuasive.

With regards to independent Claim 1, Applicant argues that the Pirolli prior art has no teaching, nor any discussion of "determining whether the [executable] application program component is suited for deployment at the edge of a computing

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network". The Office respectfully disagrees and submits that the Pirolli prior art does indeed teach the above requirement, as will be discussed below.

Pirolli discloses as his invention a method for managing client and server access to electronically stored document repositories, and more particularly, to a method for determining which documents to prefetch and cache on a computer. In one embodiment, the documents are prefetched and cached on a client computer from server located on the Internet in accordance with a computed "need probability". Documents with a higher need probability are prefetched and cached before those with lower need probabilities. The need probability for a document is computed using both a document context factor and document history factor. The context factor is determined by computing the correlation between words in the document and a context Q of the operating environment. The history factor is determined by integrating both the recency of document use and the frequency of document use. The need probability provides a measure of the likelihood that a document will be needed on the client computer or the server [Abstract] [col 2, line 54 – col 3, line17].

Pirolli further teaches that the method for caching documents at a client computer can be readily scaled to operate on proxy servers [col 11, lines18-51], which the Office broadly interprets to include reverse proxy servers or proxy caches such as edge servers. Edge servers, as noted by Applicant in his background for the invention, are well-known in the art, and are sometimes referred to as distributed caches or surrogates ("reverse proxies") or intermediaries ("interception proxies" or "forward proxies").

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Additionally, and by Applicant's own acknowledgement, Pirolli teaches that the method for prefetching and caching documents is not only limited to documentation per se, but may also be applied to any file that may be retrieved by a computer, examples of which include "executable programs" (such as Applicant's application programs) or program data files [col 12, lines 12-19]. Hence, the prefetching and caching (storing) of executables and/or documentation at a proxy server, according to a computed "need probability" (likelihood of need or suitability for storing of component at a proxy server), is taught by Pirolli. Pirolli thus discloses the requirements of Applicant's independent claims.

With respect to dependent Claims 6 & 8, Applicant argues that the combination of Pirolli/Hoffman prior arts cannot be relied upon to yield the subject matter of the claims, in particular, where the step of programmatically combining uses techniques of matrix multiplication. As Applicant has noted, the invention of Pirolli discloses vectors of keywords and links. Hoffman, for his invention, discloses the well-known technique of matrix multiplication, accommodating vectors of any size. Thus, the combination of Priolli and Hoffman teaches and provides a means for programmatically combining vectors, of any size, using the techniques of matrix multiplication. The combined disclosures satisfy the subject matter required by the claims, as written. Further, the claims, do not specify that the vectors for use in matrix multiplication have to be fixed or are of standard size for the operation to be performed.

Finally, Applicant is invited to review Patent Publication US 2003/0115281 (McHenry et al), which discloses an edge server content distribution network server management system architecture, cited but not referred to in the Office Action, but provided as an additional reference having supporting disclosures for the invention. The Office notes that, in light of Pirolli's disclosures, distribution of "content" under McHenry can be broadly interpreted to include documentation and executables.

McHenry discloses an efficient content distribution network architecture capable of providing high quality of service for both frequently encountered content requests and selectively for those that, may be of only modest or even low frequency of occurrence [0012]. This is achieved by providing multi-proxy caches located at the edge of a defined network domain with each multi-proxy cache supporting multiple clients. The multi-cache system provides simultaneous forward and reverse proxy capabilities. Portions of the reverse proxy can be logically designated to cache prefetched content. Reverse proxy caches can be limited to selectively caching content specified subject to a defined scope of content from one or more origin servers. Remaining portions of the multi-proxy caches permit caching of forward proxy requested content [0013] [0015]. McHenry further teaches that as content is discovered subject to any applicable domain specifications, corresponding metadata records are recorded in a meta-content database. These metadata records are then made available to the administrator to review, select, and assign content to multi-proxy caches [0039].

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McHenry also discloses as part of his invention, a centralized content director defines and supervises the individual operation of the enterprise network edge servers within an assigned enterprise content distribution domain. Based on the metacontent, information supplied by a system administrator, and information autonomously generated by the content director, multiple rules are generated by the content director. Each rule is tailored to define the multi-proxy cache content policies for a corresponding edge server [0030].

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Pirolli et al (hereinafter Pirolli), U.S. Patent 6,098,064.

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3. Claim 1 discloses a method of programmatically determining (Col 12, lines 1-5) edgification of components in a computing network, comprising steps of:

retrieving values for one or more characteristics of each of one or more executable application program components to be potentially edgified deployed at the edge, each of the characteristics pertaining to executable code of the application program component and each of the characteristic values specifying whether this characteristic is important for this application program component 506 / 510 (Figure 5, Col 3, lines 13-15);

retrieving values for one or more characteristics of an operating environment in which the deployment at the edge edgification is to potentially occur, each of the characteristics pertaining to execution of code in the operating environment and each of the characteristic values specifying whether this characteristic is applicable for the operating environment 508 (Figure 5, Col 3, lines 5-12; also Figure 1, Col 3, lines 61-63);

retrieving a policy which expresses how dependent associations between the characteristics of the application program components [[and]] are on the characteristics of the operating environment (Col 3, lines 18-30; Col 5, lines 15-25; and Col 10, lines 65-67); and



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programmatically combining the values of the characteristics of a particular one of the application program components, the policy, and the values of the characteristics of the operating environment to yield a result which determines whether the particular application program component is edgeable suited for deployment at the edge of the computing network 511 (Figure 5, Col 3, lines 15-17; Col 9, line 47– Col 10, line 11);

Claims 9 & 10 are rejected for the same reasons pointed out above as it differs from Claim 1 only by their statutory category.

4. Claim 2 asserts the method according to claim 1, further comprising the step of comparing the result to a threshold to determine whether the particular component is edgeable suited for deployment at the edge (Col 10, lines 42-48).

5. Claim 3 states the method according to claim 1, wherein the characteristics of the one or more application program components are supplied by developers of the components (Col 5, lines 39-51).

6. Claim 4 cites the method according to claim 1, wherein the characteristics of the operating environment are supplied by an administrator of the environment (Col 5, lines 26-38).

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7. Claim 5 points to the method according to claim 1, wherein the policy is supplied by a deployer (Col 11, lines 36-51).

8. Claim 7 identifies the method according to claim 1, wherein the values of the characteristics of the one or more application program components, values of the policy, and values of the characteristics of the operating environment range between zero and one (Col 9, lines 55-65).

9. Claim 12 (new). The method according to Claim 1, wherein the policy comprises a matrix of cells, each cell specifying a value that indicates how dependent one of the application program components is on one of the characteristics of the operating environment (Col 6, line 62 – col 7, line 7) (col 8, lines 50-55).

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6, 8, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pirolli in view of Hoffman et al (hereinafter Hoffman), U.S. Patent 5,905,666.

3. Claim 6 references the method according to claim 1, wherein the step of programmatically combining uses ~~techniques of~~ matrix multiplication.

Pirolli, in his invention, discloses that the values needed for computing at least one of the component characteristics (i.e., history factor) or the operating environment characteristics (i.e., context factor) are represented as vector elements within the respective data structure (Col 6, lines 63-67 thru Col 7, line 29, Figure 5). Pirolli also discloses that the two characteristics are combined to compute the need probability for the invention (Col 9, lines 47-67). Pirolli does not disclose that the two characteristics are programmatically combined using the technique of matrix multiplication.

However, in his invention, Hoffman discloses a method, system and data structure to facilitate matrix multiplication in solving linear programming problems involving vectors and matrices. Hoffman teaches that mathematical expressions of the general form  $Ax=b$  represent a system of linear equations, where  $x$  is a vector of variables, and  $A$  is a two-dimensional array of coefficients. If  $A$ ,  $x$ , and  $b$  are vectors or matrices, then the expression  $Ax=b$  is a matrix multiplication problem and is typically

solved by linear programming processing. He further teaches that matrix processing capability is fundamental to solving linear programming problems (Hoffman: Col 2, lines 42-48).

Hence, it would be obvious to one of ordinary skill in the art at the time of the invention to utilize the well-known matrix multiplication technique disclosed by Hoffman and incorporate it into Pirolli's invention, in order to efficiently process and compute for solutions to products of linear equations involving matrices and vectors and for overall improved computational efficiency (Hoffman: Col 3, lines 57-64).

4. Claim 8 identifies the method according to claim 1, wherein the step of programmatically combining uses modifications to techniques of matrix multiplication, wherein particular intermediate results signal changes to the matrix multiplication process.

Pirolli, in his invention, discloses that in computing for the history data factor, a variable of a given vector may be modified or incremented, such as the vector for the number of times referenced (Col 2, lines 42-48). Pirolli does not disclose that combining uses modifications to techniques of matrix multiplication, wherein particular intermediate results signal changes to the matrix multiplication process.

But, in his invention, Hoffman teaches that the varying the value of one of the variables, resulting in a different vector or matrix, has the effect of changing the values of other variables. The values for the resulting new set of basic variables define another vertex of the solution (Hoffman: Col 3, lines 38-51).

Hence, Claim 8 is rejected given the same rationale discussed above in #3 for Claim 6.

5. Claim 11 (new). The method according to Claim 1, wherein the values of the characteristics of the application program components and the values of the characteristics of the operating environment are specified in vectors (Col 6, line 62 – col 7, line 7), the policy is specified as a matrix, and the programmatically combining step further comprises multiplying the matrix by each of the vectors and summing the products to yield the result.

Claim 11 is rejected given the same rationale discussed above for Claim 6.

6. Claim 13 (new). The method according to Claim 1, wherein the cells are used, during programmatically combining step, as weighting factors for yielding the result (Col 7, line 50 – col 8, line 25).

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7. Claim 14 (new). The method according to Claim 1, wherein one of the characteristics of the application programs components is whether the application program components need a secure operating environment and one of the characteristics of the operating environment is whether the operating environment is secure.

While Pirolli teaches that the context factor of a document or executable is approximated by first defining a context Q of an operating environment to establish its relevancy (col 8, line 50 – col 9, line 24), he does not explicitly disclose whether the operating environment needs to be secure. However, operating environment characteristics are programmable and/or assignable design features of the invention, and the combined teachings of Pirolli (vector characteristics) and Hoffman (matrix multiplication) provide the means for ensuring that one of the characteristics can be assigned for securing the operating environment when necessary. It would therefore be obvious to one of ordinary skill in the art at the time of the invention, to modify the invention of Pirolli in view of Hoffman, to assign one of the characteristics of the operating environment for security when security of the operating environment is required.

***Conclusion***

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenford Madamba whose telephone number is 571-272-7989. The examiner can normally be reached on M-F 8:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zarni Maung can be reached on 571-272-3932. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**ZARNI MAUNG**  
SUPERVISORY PATENT EXAMINER

Glenford Madamba  
Examiner  
Art Unit 2151